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ABSTRACT

A 6-week research training institute was conducted during summer 1969 for 30 participants from New Hampshire, Massachusetts, Vermont, and Maine. Objectives were (1) study of problems inherent in evaluating particular curriculum changes with which the trainee was concerned; (2) study of major alternatives open to educators in terms of educational research methodologies; (3) study of communication techniques applicable to proper implementation of the decisionmaking process at various levels in the educational system; (4) use of modern data processing equipment to facilitate encoding and utilization of research data; and (5) reading of current educational literature relevant to the trainee's research project--the creation of a proposed model to evaluate an educational problem in which he was involved. The schedule consisted of classes in Methods and Techniques of Educational Research and in Research Problems in Education and workshops in use of the computer. A series of pre-and posttest evaluations indicated that the institute was successful both in substantial average gain in knowledge and in development of favorable attitudes. (Included are lists of reading and instructional materials, the institute schedule, and evaluation data and analysis.) (JS)

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FINAL REPORT
CONTRACT NO. OEG-0-9-390470-4429 (010)

The Challenge of Assessing Curriculum Changes in New England

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Bureau of Educational Research
and Testing Services
University of New Hampshire
Durham, New Hampshire 03824

1969

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University of Maryland

Dr. Daniel Stufflebeam
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Dr. Desmond Cook
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Purdue University

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University of Connecticut

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REPORT ON THE HEW SUMMER INSTITUTE - 1969

The Bureau of Educational Research and Testing Services; a sub-unit of the Department of Education, University of New Hampshire, conducted a six week research training institute during the period of July 7 to August 15, 1969. The grant provided for the training of thirty participants from any of the six New England states.

This research training institute was funded by the Department of Health, Education and Welfare, Research Training Division. The institute set for itself the following set of objectives:

1. The first major theme was the study of the problems inherent in evaluating the particular curriculum changes with which the trainee was concerned. The study of the problem of evaluation was approached by having the trainees identify, write, and evaluate objectives for instructional programs in the area of curriculum change in which they were interested.

Specific objectives:

At the end of the program the participants demonstrated their ability to perform the following tasks:

a) Identify evaluative techniques which can be utilized to provide information for making decisions about curriculum change.

b) Identify the objectives for a specific program in their area of interest.

c) Discriminate between well written and poorly written objectives.

d) Identify and construct performance objectives.

e) To translate (where possible) into performance objectives the objectives stated in the curriculum guides presently in use in their school systems which are stated in non-verbal terms.

2. The second major theme was the study of the major alternatives open to the educator in terms of educational research methodologies. For instance: the experimental approach as typified by the work of Campbell and Stanley, or the context, input, process and production (CIPP) model as presented by Daniel L. Stufflebeam. In either approach the program review and evaluation techniques, (PERT) developed for education by Desmond Cook, will be advocated as the method of organizing the project.

Specific Objectives

At the end of the program the participants demonstrated their ability to perform the following tasks:

a) Identify the classification scheme of the CIPP evaluation model.

b) Construct a research study using either context evaluation, input evaluation, process evaluation or product evaluation.

c) Describe the difference between an experimental and a quasi-experimental design for educational research.

d) Order, using the PERT technique, the planning of an educational research study.

3. The third major theme was the study of communications techniques applicable to proper implementation of the decision-making process at various levels of the educational systems.

Specific Objectives

At the end of the program the participants demonstrated their ability to perform the following tasks:

a) Interpret the research findings of several journal articles.

b) Demonstrate the competency to apply the findings of a research study to one's local school situation.

c) Describe the problems associated with dissemination and adoption of the general kind of educational research findings to a local school system.

4. The fourth major theme was the use of modern data processing equipment to facilitate the encoding and utilization of research data.

Specific Objectives

At the end of the program the participants demonstrated their ability to perform the following tasks:

a) Construct a simple computer program.

b) Identify the problems associated with designing an optically scannable document.

c) Demonstrate the ability to operate a remote terminal.

d) Name and describe the use of a variety of modern data processing equipment and its utilization in educational research.

5. The fifth major theme was reading of current educational literature relevant to the research project with which the trainee is involved.

Specific Objectives

At the end of the program the participants demonstrated their ability to perform the following tasks:

a) To identify the major reference sources for educational research literature.

b) Construct a bibliography in the area of the trainees' interest.

c) Distinguish the major components of a piece of well written educational research.

At the end of the institute each of the participants was given an evaluation form in which he was asked to evaluate on a four-point scale the attainment by this institute of its specifically stated original objectives. A copy of this evaluation will be found in Appendix A. A mean was calculated not only for each specific objective but also by a grouping of all the specific objectives into a single catagory for each of the five major themes. In general all means are in excess of three points, indicating that the participants felt that the objectives had been well attained at a ranking of between good to excellent.

OBJECTIVES EVALUATION

```
MEAN( 1)= 3.62 --------1a
MEAN( 2)= 3.66 --------1b
MEAN( 3)= 3.77 --------1c
MEAN( 4)= 3.77 --------1d
MEAN( 5)= 3.37 --------1e
MEAN( 6)= 3.59 --------2a
MEAN( 7)= 3.25 --------2b
MEAN( 8)= 2.85 --------2c
MEAN( 9)= 3.03 --------2d
MEAN(10)= 2.84 --------3a
MEAN(11)= 3.11 --------3b
MEAN(12)= 3.11 --------3c
MEAN(13)= 3.51 --------4a
MEAN(14)= 3.07 --------4b
MEAN(15)= 2.52 --------4c
MEAN(16)= 3.03 --------4d
MEAN(17)= 3.00 --------5a
MEAN(18)= 2.96 --------5b
MEAN(19)= 3.46 --------5c
MEAN(20)= 0.00
MEAN OF QUESTION 1 3.644444
MEAN OF QUESTION 2 3.185185
MEAN OF QUESTION 3 3.025641
MEAN OF QUESTION 4 3.081632
MEAN OF QUESTION 5 3.139240
```

At the end of the institute the participants were asked to evaluate the extent to which the institute meet its objectives. This was done on a four point basis, and reduced in similar fashion to the instructor evaluations. (see evaluation form)

The geographical distribution of the participants in this institute was as follows:

Maine	2
Vermont	3
New Hampshire	21
Massachusetts	3
Rhode Island	0
Connecticut	0

THE PROPOSED LEARNING SEQUENCE

The institute was conducted daily from 8:30 A.M. to 4:00 P.M. for six weeks. The institute offered credit in two courses. These two courses are described below:

Education 881, Methods and Techniques of Educational Research. This course is a critical study of the principal methods employed in the investigation of educational problems and an evaluation of the procedures and standards used in reporting the findings; designed as an advanced course for Master's Degree candidates.

Education 882, Research Problems in Education, is concerned with the individual investigation of a problem in the area of educational research. This course will be used first to expose the trainees to a variety of educational research. In the latter portion, each trainee will be expected to develop a research proposal which will have practical importance and relevance to his home district, or to evaluate a project presently being studied.

The two courses described above were offered daily between 8:30 A.M. and 11:45 A.M. The period from 1:00 P.M. through 2:30 P.M. each day was held open for individualized consultation and library research. The institute

met each afternoon from 2:30 P.M. through 4:00 P.M. during which time the trainees were instructed in the use of the computer as an educational tool.

The first week was given over to an intensive study of the construction of behavioral objectives, the design of assessment tasks, the construction of learning sequences and a study of their empirical foundations. Supporting and instructional materials included: The Conditions of Learning, Robert M. Gagne; AERA Monograph Series on Curriculum Evaluations; Preparing Instructional Objectives, by Robert F. Mager; Developing Attitude Toward Learning, by Robert F. Mager; a number of audio-visual aids such as the Popham film strip series on objectives as well as the audio-visual series called, "Why Behavioral Objectives?" The participants were also given the following mimeographed handouts: Definition of Ten Action Words: Evaluation of Science: a Process Approach; A Hierarchically Based Test Battery for Assessing Scientific Inquiry. (Appendix B)

The second week of the institute was instructed by Dr. Henry H. Walbesser. The primary task of the trainees was to read and complete the paperback called, "Constructing Behavioral Objectives" as well as a series of thirty-seven tasks which Dr. Walbesser and the Director of the Institute had worked out during the spring semester. Dr. Walbesser was assisted by two group leaders so that a low 1-10 teacher-student ratio could be maintained in the small group instruction.

The third week of the institute was given over to a study of different models for evaluating education. Supporting instructional materials included, Experimental and Quasi-Experimental Designs for Research, by Donald T. Campbell and Julian C. Stanley; Evaluation as Enlightenment for Decision Making by Daniel L. Stufflebeam; Handbook of Research on Teaching by Nathaniel Gage: Statistical Analysis in Psychology and Education by Ferguson; Non-Parametric Statistics for the Behavioral Sciences by Sidney Siegel.

The fourth week of the institute was instructed by Dr. Daniel Stufflebeam. The learning sequence was worked out with Dr. Stufflebeam during the spring semester. He was assisted in his instruction by three group leaders who were trained in the use of the CIPP evaluation model, and were an aid in the small group instruction.

The fifth week, the first two days were given over to a study of the PERT technique in education. The supporting instructional materials included: Program Evaluation and Review Technique, Applications in Education by Desmond L. Cook. The content of that instruction was worked out between Dr. Cook and the project director during the spring semester. The fifth day of the fifth week, Dr. John Cawley, University of Connecticut presented a paper entitled, "Research in Reading and Psychomoter Disabilities."

The sixth week, the first two days were given over to a study of the problems associated with the development, dissemination and adoption (DD&A) processes in education. The third and fourth days were under

the instruction of Dr. William Asher. The content of those two days was worked out between Dr. Asher and the director of the Institute during the spring semester. The fifth day of the sixth week was given over to a presentation by Maurice Olivier. The topic was "The Potential of Systems Thinking in Education".

During the first four weeks of the institute, each afternoon between 2:30 P.M. and 4:00 P.M. the trainees were instructed in the use of the computer. They were taught to identify the basic components of it and were given an introduction to computer programming. The major emphasis of the learning sequence, however, was the demonstration by the trainees of mastery of the use of a remote terminal. During the spring semester a series of simple statistical programs was written and stored so that the institutees could call them out in the memory of the computer and so use them in computational tasks. Therefore, the last two weeks of the institute the trainees were concerned with the use of the computer only as a tool in working on their particular problems. The instructor was available each afternoon between 2:30 P.M. and 4:00P.M. as a resource person to help them in any way that was necessary.

A major requirement of the institute was the creation by each trainee of a proposed model to evaluate the educational problem which which he is involved.

The material which has just been presented is what the author of this particular proposal originally proposed to do. The question now is, how well was it done? In an attempt to assess the adequacy or inadequacy of this summer institute, the following assessment tasks were undertaken: A lengthy pre-test and post-test were constructed. The pre-test and post-test consisted of 160 multiple choice items. These questions were in general drawn from a test designed by Gene V. Glass which was entitled, "Mastery Test Items for Courses in Educational Research Methods". A copy of this pre-test, post-test will be found in Appendix A of this report. A complete set of statistics based on both the pre-test and post-test results are included immediately after this section. They consist of the following: a complete item analysis and item count on each of the questions; the computing of the mean, the standard deviation and the range of scores; the transforming of all scores to z scores and to standard scores; the standard score being based on a mean of 500 and a standard deviation of 100; a calculation of a frequency distribution as well as cumulative percentile based on that frequency distribution. The print-out of the individual students' scores included their raw score; their percentile rank; their stanine; their standard score and a z score. The mean on the pre-test was 54.48 with a standard deviation of 17.99. The range was from 20 through 95 raw score points. The same complete set of statistics was calculated on the post-test and this is also found immediately following this section. The mean of the post-test was 87.55 with a standard deviation of 16.65. The range was from 53 to 117 raw score points. The

average gain, then, over the six week period from the pre-test to the post-test was 33.11 score points. This is a very significant gain. Immediately following the test analysis will be found a chart which indicates for the individuals in the institute the raw point score gain and the percent of gain over the six week period. The gain scores go from a low of a 2 point raw score increase to a high of 66 raw score points which is equivalent to a 330% gain over the pre-test score.

THE CHALLENGE OF ASSESING CURRICULUM CHANGES IN NEW ENGLAND
PRE-TEST ADMINISTERED JULY 7,1969

ITEM	MEAN P	MEAN F	PCT P	CHOICE... A	B	C	D	E	DK	OMIT
1	63.1	47.4	45	2	0	13*	4	0	10	0
2	62.3	43.3	59	5	1	0	17*	0	6	0
3	53.9	54.7	31	9*	5	1	2	0	12	0
4	61.3	50.8	34	4	2	3	10*	0	10	0
5	63.0	42.3	59	1	6	2	17*	0	3	0
6	58.0	45.0	72	21*	6	0	0	0	2	0
7	62.7	51.8	24	7*	16	0	3	0	3	0
8	55.2	53.5	55	2	5	16*	5	0	1	0
9	56.6	46.3	79	23*	0	2	3	0	1	0
10	63.1	49.2	38	0	11*	11	4	0	3	0
11	62.1	49.8	38	4	11*	0	3	1	10	0
12	61.7	46.7	52	4	15*	4	1	0	5	0
13	61.8	48.4	45	2	3	2	13*	1	8	0
14	54.9	54.0	52	8	4	15*	1	0	1	0
15	71.5	53.2	7	2*	0	12	13	0	2	0
16	56.6	44.2	83	24*	0	3	1	0	1	0
17	72.6	50.7	17	5*	5	1	9	0	9	0
18	58.5	52.9	28	1	0	8*	13	0	7	0
19	55.0	39.0	97	0	0	0	1	28*	0	0
20	85.0	53.4	3	1*	1	0	1	0	26	0
21	57.0	54.4	3	1*	4	5	0	0	19	0
22	58.7	50.5	48	1	2	0	14*	0	12	0
23	59.0	52.4	31	9*	0	6	0	1	13	0
24	63.0	52.7	17	10	5*	2	0	0	12	0
25	54.2	54.8	55	0	0	3	16*	2	8	0
26	0.0	54.4	1	0	3	0*	7	4	15	0
27	59.2	51.6	38	2	5	0	11*	1	10	0
28	57.0	48.7	69	0	0	9	20*	0	0	0
29	54.2	55.1	76	0	2	22*	4	0	1	0
30	54.9	53.0	76	22*	3	1	0	0	3	0
31	57.7	52.7	34	5	10*	0	2	0	12	0
32	55.5	54.3	14	4	4*	17	0	0	4	0
33	60.3	47.2	55	1	2	16*	1	0	9	0
34	57.1	44.3	79	23*	3	0	0	0	3	0
35	60.5	43.0	66	19*	4	0	0	0	6	0
36	52.0	54.7	10	11	3*	8	2	0	5	0
37	47.3	55.3	10	14	2	3*	3	0	7	0
38	60.0	50.5	41	12*	3	1	6	0	7	0
39	68.0	50.9	21	6*	1	3	13	0	6	0
40	63.8	50.9	28	3	4	4	8*	0	10	0
41	57.7	51.8	45	1	13*	8	4	0	3	0
42	67.0	49.7	28	0	16	0	8*	0	5	0
43	64.5	46.3	45	0	7	3	13*	2	4	0
44	68.2	43.2	45	13*	3	3	0	0	10	0
45	54.7	54.1	52	1	2	15*	3	0	8	0
46	56.9	49.7	66	2	19*	3	2	0	3	0
47	61.4	51.8	28	3	0	0	2	8*	16	0
48	77.0	51.8	10	3*	1	1	1	0	23	0
49	0.0	54.4	1	5	4	0*	1	0	19	0
50	58.0	54.3	3	2	1*	2	0	0	24	0

MEAN P = MEAN OF ALL PASSING ITEM
MEAN F = MEAN OF ALL FAILING ITEM
PCT P = TOTAL PERCENT PASSING ITEM
* = CORRECT CHOICE

THE CHALLENGE OF ASSESING CURRICULUM CHANGES IN NEW ENGLAND
PRE-TEST ADMINISTERED JULY 7,1969

ITEM	MEAN P	MEAN F	PCT P	CHOICE... A	B	C	D	E	DK	OMIT
51	73.4	50.5	17	0	2	5*	0	0	22	0
52	65.2	52.2	17	5*	3	0	0	0	21	0
53	75.5	52.9	7	0	0	2*	2	0	25	0
54	56.8	53.2	34	2	0	2	1	10*	14	0
55	52.9	60.5	79	23*	6	0	0	0	0	0
56	58.2	51.8	41	16	12*	0	0	0	1	0
57	0.0	54.4	1	0	0	0*	0	0	29	0
58	57.7	38.8	83	24*	5	0	0	0	0	0
59	58.5	53.4	21	3	6*	2	0	0	18	0
60	59.8	44.3	66	6	0	19*	0	0	4	0
61	61.4	51.8	28	1	1	1	8*	4	14	0
62	63.3	53.4	10	5	1	3*	12	1	7	0
63	52.5	54.8	14	4*	2	9	4	0	10	0
64	65.5	45.4	45	5	13*	1	3	0	7	0
65	56.3	53.8	28	0	10	6	0	8*	5	0
66	55.8	46.3	86	0	2	25*	0	2	0	0
67	62.6	46.8	48	6	14*	1	2	2	4	0
68	70.1	48.5	28	8*	12	0	0	4	5	0
69	56.5	53.9	21	0	2	6*	0	11	10	0
70	52.2	54.9	17	5*	0	19	0	0	5	0
71	58.0	52.6	34	13	0	0	10*	0	6	0
72	55.4	54.1	24	1	1	7*	0	1	19	0
73	58.0	41.0	79	0	23*	1	2	0	3	0
74	54.9	53.8	59	17*	0	5	3	0	4	0
75	60.5	52.9	21	4	0	6*	5	0	14	0
76	62.6	51.3	28	8	1	8*	0	0	12	0
77	63.8	53.0	14	4*	1	0	0	1	23	0
78	67.2	51.1	21	0	6*	1	0	0	22	0
79	70.6	45.9	34	1	0	10*	4	0	14	0
80	63.2	52.6	17	5*	1	13	1	0	9	0
81	74.3	52.2	10	3*	0	0	1	0	25	0
82	71.6	46.7	31	3	1	1	9*	0	15	0
83	54.4	55.0	90	1	0	0	26*	0	2	0
84	55.6	53.5	45	2	13*	1	2	0	11	0
85	85.0	53.4	3	3	1*	5	1	1	18	0
86	65.3	46.8	41	5	3	3	12*	0	6	0
87	62.4	51.4	28	0	8*	3	6	0	12	0
88	61.8	51.7	28	11	8*	0	0	0	10	0
89	61.1	46.3	55	4	16*	0	0	0	9	0
90	68.4	49.1	28	5	4	5	8*	0	7	0
91	76.7	51.9	10	5	5	2	3*	0	14	0
92	61.0	53.7	10	3*	4	2	5	0	15	0
93	68.7	48.0	31	3	1	9*	2	0	14	0
94	73.8	50.4	17	2	5*	4	5	0	13	0
95	69.3	52.1	14	4*	6	2	2	0	15	0
96	68.1	50.1	24	0	1	7*	6	0	15	0
97	66.8	51.9	17	1	5*	6	3	0	14	0
98	71.8	50.8	17	6	2	5*	1	0	15	0
99	71.6	47.9	28	8*	1	4	1	0	15	0
100	0.0	54.4	1	1	0*	3	0	1	24	0

MEAN P = MEAN OF ALL PASSING ITEM
MEAN F = MEAN OF ALL FAILING ITEM
PCT P = TOTAL PERCENT PASSING ITEM
* = CORRECT CHOICE

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PRE-TEST ADMINISTERED JULY 7,1969

ITEM	MEAN P	MEAN F	PCT P	CHOICE... A	B	C	D	E	DK	OMIT
101	63.8	49.5	34	2	2	0	1	10*	14	0
102	54.0	55.4	69	6	20*	0	0	0	3	0
103	59.5	52.5	28	16	8*	0	0	0	5	0
104	52.4	55.1	24	10	7*	0	0	0	12	0
105	59.2	49.4	52	15*	4	0	0	0	10	0
106	62.9	47.6	45	13*	6	0	0	0	10	0
107	63.1	51.1	28	12	8*	0	0	0	9	0
108	82.7	51.2	10	0	0	2	3*	13	11	0
109	87.7	50.6	10	0	3*	6	1	4	15	0
110	59.8	53.3	17	3	2	5*	2	1	16	0
111	59.4	52.6	28	11	0	1	8*	0	9	0
112	59.7	45.8	62	1	18*	1	2	0	7	0
113	85.0	53.4	3	3	0	1	1*	0	24	0
114	58.3	44.4	72	21*	4	0	0	0	4	0
115	58.3	45.9	69	20*	7	0	0	0	2	0
116	57.0	52.1	48	14*	11	0	0	0	4	0
117	64.8	47.2	41	1	0	1	12*	0	15	0
118	58.7	43.2	72	21*	3	0	0	0	5	0
119	59.5	49.0	52	1	15*	6	3	0	4	0
120	67.3	49.6	28	0	8*	0	9	0	12	0
121	66.7	53.0	10	10	2	3*	4	0	10	0
122	58.2	49.2	59	2	0	1	17*	7	2	0
123	58.3	52.4	34	10*	0	0	1	2	16	0
124	71.4	49.0	24	2	4	1*	4	0	12	0
125	57.8	52.7	34	10*	1	2	1	0	15	0
126	78.7	46.7	24	3	1*	3	2	0	14	0
127	57.4	47.8	69	1	20*	1	0	0	7	0
128	64.5	52.8	14	4*	6	2	1	2	14	0
129	51.7	54.8	10	3*	1	8	10	0	7	0
130	68.8	49.0	28	2	0	8*	1	0	18	0
131	73.0	51.5	14	0	4*	0	5	0	20	0
132	72.3	49.8	21	6*	2	6	6	0	9	0
133	63.5	49.7	34	0	3	3	10*	0	13	0
134	46.7	55.3	10	3	0	2	4	3*	17	0
135	68.6	51.5	17	0	1	1	5*	1	21	0
136	67.8	51.0	21	6*	0	1	4	0	18	0
137	0.0	54.4	1	6	0	0*	6	0	17	0
138	76.0	52.0	10	1	1	2	3*	0	22	0
139	67.9	50.2	24	0	7*	0	2	0	20	0
140	53.3	54.9	28	3	6	2	8*	0	10	0
141	0.0	54.4	1	6	5	1	0*	0	17	0
142	0.0	54.4	1	5	3	3	2	0*	16	0
143	56.8	54.0	17	8	5*	0	0	0	16	0
144	51.2	56.4	38	7	2	11*	5	0	4	0
145	53.8	60.3	90	0	26*	2	1	0	0	0
146	59.4	47.5	59	3	5	17*	0	0	4	0
147	66.5	47.1	38	0	2	11*	8	0	8	0
148	70.0	53.9	3	0	1	1*	0	0	27	0
149	58.6	53.1	24	8	2	7*	7	0	5	0
150	59.5	44.8	66	4	19*	0	0	0	6	0

MEAN P = MEAN OF ALL PASSING ITEM
MEAN F = MEAN OF ALL FAILING ITEM
PCT P = TOTAL PERCENT PASSING ITEM
* = CORRECT CHOICE

THE CHALLENGE OF ASSESING CURRICULUM CHANGES IN NEW ENGLAND
PRE-TEST ADMINISTERED, JULY 7, 1969

ITEM	MEAN P	MEAN F	PCT P	CHOICE... A	B	C	D	E	DK	OMIT
151	70.0	52.0	14	0	0	4*	1	8	16	0
152	62.7	49.4	38	6	4	11*	3	0	5	0
153	68.2	51.6	17	5*	3	2	5	0	14	0
154	62.0	50.5	34	7	10*	1	5	0	6	0
155	57.3	48.0	69	0	0	0	20*	0	9	0
156	58.5	52.3	34	10*	3	0	1	8	7	0
157	60.6	50.1	41	1	12*	0	0	1	15	0
158	0.0	54.4	1	0	1	1	0*	0	27	0
159	73.7	52.2	10	3*	2	3	2	0	19	0
160	0.0	54.4	1	0*	8	0	0	0	21	0

MEAN P = MEAN OF ALL PASSING ITEM
MEAN F = MEAN OF ALL FAILING ITEM
PCT P = TOTAL PERCENT PASSING ITEM
* = CORRECT CHOICE

THE CHALLENGE OF ASSESING CURRICULUM CHANGES IN NEW ENGLAND
PRE-TEST ADMINISTERED JULY 7,1969

MEAN= 54.448 SD= 17.997 N= 29 RANGE= 20- 95

SCORE	Z SCO.	TR-SCO.	FREQ.	PCT.	ONE * = 1
20	-1.91	308.59	1	3	*
21	-1.86	314.15	0	3	*
22	-1.80	319.70	0	3	*
23	-1.75	325.26	1	7	*
24	-1.69	330.82	0	7	*
25	-1.64	336.37	0	7	*
26	-1.58	341.93	0	7	*
27	-1.53	347.49	0	7	*
28	-1.47	353.04	0	7	*
29	-1.41	358.60	0	7	*
30	-1.36	364.15	0	7	*
31	-1.30	369.71	0	7	*
32	-1.25	375.27	0	7	*
33	-1.19	380.82	0	7	*
34	-1.14	386.38	0	7	*
35	-1.08	391.94	0	7	*
36	-1.03	397.49	0	7	*
37	-0.97	403.05	0	7	*
38	-0.91	408.61	0	7	*
39	-0.86	414.16	2	14	**
40	-0.80	419.72	1	17	*
41	-0.75	425.28	1	21	*
42	-0.69	430.83	1	24	*
43	-0.64	436.39	0	24	*
44	-0.58	441.94	2	31	**
45	-0.52	447.50	2	38	**
46	-0.47	453.06	0	38	*
47	-0.41	458.61	1	41	*
48	-0.36	464.17	2	48	**
49	-0.30	469.73	0	48	*
50	-0.25	475.28	0	48	*
51	-0.19	480.84	2	55	**
52	-0.14	486.40	1	59	*
53	-0.08	491.95	0	59	*
54	-0.02	497.51	0	59	*
55	0.03	503.07	0	59	*
56	0.09	508.62	0	59	*
57	0.14	514.18	1	62	*
58	0.20	519.73	1	66	*
59	0.25	525.29	0	66	*
60	0.31	530.85	0	66	*
61	0.36	536.40	1	69	*
62	0.42	541.96	0	69	*
63	0.48	547.52	1	72	*
64	0.53	553.07	0	72	*
65	0.59	558.63	0	72	*
66	0.64	564.19	1	76	*
67	0.70	569.74	1	79	*
68	0.75	575.30	0	79	*
69	0.81	580.86	0	79	*
70	0.86	586.41	2	86	**

THE CHALLENGE OF ASSESING CURRICULUM CHANGES IN NEW ENGLAND
PRE-TEST ADMINISTERED JULY 7,1969

MEAN= 54.448 SD= 17.997 N= 29 RANGE= 20- 95

SCORE	Z SCO.	TR-SCO.	FREQ.	PCT.	ONE * = 1
71	0.92	591.97	0	86	*
72	0.98	597.52	0	86	*
73	1.03	603.08	0	86	*
74	1.09	608.64	0	86	*
75	1.14	614.19	0	86	*
76	1.20	619.75	0	86	*
77	1.25	625.31	0	86	*
78	1.31	630.86	1	90	*
79	1.36	636.42	0	90	*
80	1.42	641.98	0	90	*
81	1.48	647.53	0	90	*
82	1.53	653.09	0	90	*
83	1.59	658.65	0	90	*
84	1.64	664.20	0	90	*
85	1.70	669.76	1	93	*
86	1.75	675.31	0	93	*
87	1.81	680.87	0	93	*
88	1.86	686.43	0	93	*
89	1.92	691.98	0	93	*
90	1.98	697.54	1	97	*
91	2.03	703.10	0	97	*
92	2.09	708.65	0	97	*
93	2.14	714.21	0	97	*
94	2.20	719.77	0	97	*
95	2.25	725.32	1	100	*

THE CHALLENGE OF ASSESING CURRICULUM CHANGES IN NEW ENGLAND
PRE-TEST ADMINISTERED JULY 7,1965

STUDENT NAME		SCORE	PCT.RANK	STA	STD.SCORE	Z-SCORE
ABBOTT	DOUGLAS W	78	90	7	631.	1.31
APT	FREDERICS	40	17	3	420.	-0.80
BARNES	EVERETT W	39	14	2	414.	-0.86
CAMERON	PHILIP J	45	38	4	448.	-0.52
COGAN	RICHARD W	70	86	7	586.	0.86
DARLING	SCOTT	58	66	6	520.	0.20
DIXON	R ALPH E	47	41	4	459.	-0.41
EMILI Q	ANN D	39	14	2	414.	-0.86
EVANS	NORMAN	61	69	6	536.	0.36
FEUERSTEIN	MARTIN	52	59	5	486.	-0.14
GRAHAM	CONRAD	51	55	5	481.	-0.19
GRODINSKY	HAROLD M	66	76	6	564.	0.64
HACKETT	FRANCIS	48	48	5	464.	-0.36
HARNOIS	HERMAN A	45	38	4	448.	-0.52
HOKANS	CORLYN	85	93	8	670.	1.70
LANCE	W ILLIAM	20	3	1	309.	-1.91
LEWIS	GEORGE	42	24	3	431.	-0.69
MACFARLANE	JAMES W	63	72	6	548.	0.48
MARSTON	CHARLES	67	79	7	570.	0.70
MURDOCK	ALLEN D	41	21	3	425.	-0.75
OSBORNE	DOUGLAS	57	62	6	514.	0.14
PHAUP	PATRICK W	23	7	2	325.	-1.75
POIRIER	ROBERT	44	31	4	442.	-0.58
POPLAWSKI	EUGENE	70	86	7	586.	0.86
RICE	ROBERT	95	100	9	725.	2.25
ROYA	LUCY ANN	51	55	5	481.	-0.19

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THE CHALLENGE OF ASSESING CURRICULUM CHANGES IN NEW ENGLAND
PRE-TEST ADMINISTERED JULY 7,1969

STUDENT NAME		SCORE	PCT.RANK	STA	STD.SCORE	Z-SCORE
SIMPSON	VELMA	48	48	5	464.	-0.36
TOMKINSON	LESTER	44	31	4	442.	-0.58
WINSLOW	EDWARD	90	97	8	698.	1.98

THE CHALLENGE OF ASSESING CURRICULUM CHANGES IN NEW ENGLAND
POST-TEST ADMINISTERED AUGUST 15,1969 OMIT AS A SIXTH CHOICE

ITEM	MEAN P	MEAN F	PCT P	CHOICE... A	B	C	D	E	DK	OMIT
1	90.6	85.4	41	7	4	12*	6	0	0	0
2	88.5	85.8	66	6	1	3	19*	0	0	0
3	79.0	91.4	31	9*	4	2	14	0	0	0
4	92.5	84.1	41	7	2	8	12*	0	0	0
5	90.7	75.7	79	0	4	2	23*	0	0	0
6	88.6	81.3	86	25*	4	0	0	0	0	0
7	94.2	78.1	59	17*	11	0	1	0	0	0
8	89.8	84.4	59	1	8	17*	3	0	0	0
9	88.1	80.5	93	27*	0	1	1	0	0	0
10	98.9	82.4	31	0	9*	13	7	0	0	0
11	89.6	83.7	66	7	19*	0	3	0	0	0
12	90.7	81.5	66	5	19*	4	1	0	0	0
13	86.6	87.9	24	2	19	1	7*	0	0	0
14	91.0	79.9	69	7	2	20*	0	0	0	0
15	97.6	81.4	38	11*	0	12	6	0	0	0
16	91.3	75.9	76	22*	1	2	4	0	0	0
17	98.0	85.4	17	5*	4	2	18	0	0	0
18	95.0	83.6	34	3	1	10*	15	0	0	0
19	87.8	81.0	97	0	0	0	1	28*	0	0
20	84.8	89.5	41	12*	10	5	2	0	0	0
21	88.3	87.0	41	12*	9	6	2	0	0	0
22	101.7	83.0	24	16	1	5	7*	0	0	0
23	89.3	86.3	41	12*	0	9	5	3	0	0
24	95.0	84.2	31	17	9*	3	0	0	0	0
25	89.0	83.9	72	2	5	1	21*	0	0	0
26	88.5	87.3	21	0	6	6*	9	8	0	0
27	89.6	84.2	62	2	6	2	18*	1	0	0
28	87.0	89.3	76	0	5	2	22*	0	0	0
29	90.8	72.2	83	1	1	24*	3	0	0	0
30	89.6	75.0	86	25*	3	0	1	0	0	0
31	92.8	82.7	48	3	14*	2	10	0	0	0
32	88.8	86.9	34	3	10*	16	0	0	0	0
33	87.4	88.5	86	0	0	25*	4	0	0	0
34	89.2	79.6	83	24*	5	0	0	0	0	0
35	89.6	75.0	86	25*	4	0	0	0	0	0
36	84.0	88.0	10	23	3*	2	1	0	0	0
37	82.8	88.8	21	19	2	6*	2	0	0	0
38	96.0	81.6	41	12*	1	4	12	0	0	0
39	95.2	85.6	21	6*	3	4	16	0	0	0
40	89.9	86.7	28	13	2	6	8*	0	0	0
41	94.7	80.9	48	2	14*	9	4	0	0	0
42	91.4	82.8	55	0	13	0	16*	0	0	0
43	93.6	78.9	59	0	9	2	17*	1	0	0
44	91.4	80.3	66	19*	9	1	0	0	0	0
45	88.1	83.0	90	0	0	26*	3	0	0	0
46	90.2	64.3	90	1	26*	2	0	0	0	0
47	89.1	66.5	93	1	0	1	0	27*	0	0
48	89.4	85.6	52	15*	8	2	4	0	0	0
49	99.8	85.6	14	14	11	4*	0	0	0	0
50	87.3	87.7	41	7	12*	10	0	0	0	0

MEAN P = MEAN OF ALL PASSING ITEM
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PCT P = TOTAL PERCENT PASSING ITEM
* = CORRECT CHOICE

THE CHALLENGE OF ASSESING CURRICULUM CHANGES IN NEW ENGLAND
POST-TEST ADMINISTERED AUGUST 15,1969 OMIT AS A SIXTH CHOICE

ITEM	MEAN P	MEAN F	PCT P	CHOICE... A	B	C	D	E	DK	OMIT
51	90.0	83.5	62	6	5	18*	0	0	0	0
52	90.2	83.2	62	18*	6	5	0	0	0	0
53	86.9	87.9	38	3	4	11*	11	0	0	0
54	91.0	82.7	59	6	2	0	4	17*	0	0
55	89.0	78.3	86	25*	4	0	0	0	0	0
56	90.4	85.8	38	18	11*	0	0	0	0	0
57	93.8	79.3	55	5	3	16*	5	0	0	0
58	88.9	69.0	93	27*	2	0	0	0	0	0
59	90.5	83.4	59	3	17*	6	3	0	0	0
60	90.6	79.6	72	7	0	21*	1	0	0	0
61	102.6	80.8	31	0	3	2	9*	14	1	0
62	100.6	84.8	17	11	1	5*	11	1	0	0
63	95.8	82.5	38	11*	3	8	7	0	0	0
64	85.5	89.7	52	3	15*	9	2	0	0	0
65	99.5	81.3	34	2	6	10	1	10*	0	0
66	89.9	67.0	90	0	2	26*	0	1	0	0
67	91.9	71.0	79	5	23*	1	0	0	0	0
68	88.7	86.2	55	16*	7	0	4	2	0	0
69	97.4	83.8	28	1	2	8*	0	18	0	0
70	93.5	83.9	38	11*	2	16	0	0	0	0
71	93.2	72.8	72	8	0	0	21*	0	0	0
72	91.5	78.8	69	2	0	20*	1	6	0	0
73	89.4	63.0	93	1	27*	0	1	0	0	0
74	93.2	75.0	69	20*	0	5	4	0	0	0
75	98.3	79.9	41	13	1	12*	3	0	0	0
76	95.8	80.9	45	15	0	13*	2	0	0	0
77	89.2	86.7	34	10*	6	0	3	10	0	0
78	92.8	81.1	55	4	16*	4	5	0	0	0
79	91.6	68.2	83	1	1	24*	3	0	0	0
80	90.7	86.1	31	9*	2	17	1	0	0	0
81	93.9	75.4	66	19*	2	2	6	0	0	0
82	86.4	88.6	48	12	3	0	14*	0	0	0
83	87.2	97.0	97	0	0	1	28*	0	0	0
84	87.2	89.0	79	0	23*	2	4	0	0	0
85	94.5	84.9	28	1	8*	15	4	1	0	0
86	90.1	85.2	48	9	6	0	14*	0	0	0
87	88.6	85.1	69	2	20*	6	1	0	0	0
88	88.2	86.8	55	13	16*	0	0	0	0	0
89	90.6	80.8	69	9	20*	0	0	0	0	0
90	94.8	84.3	31	11	3	4	9*	2	0	0
91	83.0	87.9	7	11	13	2	2*	1	0	0
92	86.6	88.4	48	14*	7	3	5	0	0	0
93	95.8	81.8	41	7	7	12*	3	0	0	0
94	103.2	83.5	21	10	6*	8	5	0	0	0
95	101.4	83.1	24	7*	8	11	3	0	0	0
96	92.1	84.4	41	3	5	12*	9	0	0	0
97	90.6	86.9	17	7	5*	13	4	0	0	0
98	93.3	80.5	55	9	1	16*	3	0	0	0
99	89.5	78.0	83	24*	2	0	3	0	0	0
100	91.6	86.7	17	13	5*	9	2	0	0	0

MEAN P = MEAN OF ALL PASSING ITEM
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THE CHALLENGE OF ASSESING CURRICULUM CHANGES IN NEW ENGLAND
POST-TEST ADMINISTERED AUGUST 15,1969 OMIT AS A SIXTH CHOICE

ITEM	MEAN P	MEAN F	PCT P	CHOICE... A	B	C	D	E	DK	OMIT
101	87.8	87.1	62	5	1	2	3	18*	0	0
102	87.9	86.4	76	7	22*	0	0	0	0	0
103	93.8	85.2	28	21	8*	0	0	0	0	0
104	87.4	87.6	34	19	10*	0	0	0	0	0
105	90.0	81.0	72	21*	8	0	0	0	0	0
106	86.8	89.9	76	22*	7	0	0	0	0	0
107	88.6	86.5	48	15	14*	0	0	0	0	0
108	75.6	90.0	17	1	0	3	5*	20	0	0
109	99.0	83.9	24	0	7*	11	2	9	0	0
110	93.6	82.6	45	13	1	13*	0	2	0	0
111	86.0	88.8	45	13	1	2	13*	0	0	0
112	87.6	87.0	97	0	28*	0	1	0	0	0
113	92.7	84.8	34	6	6	7	10*	0	0	0
114	89.9	76.4	83	24*	5	0	0	0	0	0
115	87.6	0.0	99	29*	0	0	0	0	0	0
116	89.6	77.8	83	24*	5	0	0	0	0	0
117	88.6	84.9	72	7	0	1	21*	0	0	0
118	88.8	81.8	83	24*	5	0	0	0	0	0
119	91.3	81.4	62	1	18*	10	0	0	0	0
120	92.8	83.3	45	0	13*	4	12	0	0	0
121	95.6	83.3	34	12	4	10*	3	0	0	0
122	87.8	86.0	86	2	0	2	25*	0	0	0
123	89.3	79.4	83	24*	2	0	1	2	0	0
124	87.9	87.4	31	2	10	9*	8	0	0	0
125	89.6	79.7	79	23*	1	1	3	1	0	0
126	95.3	78.1	55	5	16*	1	7	0	0	0
127	89.6	81.1	76	7	22*	0	0	0	0	0
128	90.5	82.7	62	18*	4	2	5	0	0	0
129	95.3	83.5	34	10*	2	0	17	0	0	0
130	91.8	78.1	69	1	6	20*	2	0	0	0
131	93.2	78.3	62	4	18*	3	4	0	0	0
132	91.2	81.5	62	18*	1	3	7	0	0	0
133	94.5	77.7	59	3	2	7	17*	0	0	0
134	90.9	86.3	28	4	1	4	12	8*	0	0
135	91.9	86.2	24	8	4	5	7*	4	1	0
136	89.6	60.0	93	27*	1	1	0	0	0	0
137	93.1	83.6	41	7	0	12*	10	0	0	0
138	93.3	74.9	69	0	4	5	20*	0	0	0
139	92.3	83.1	48	3	14*	2	9	0	1	0
140	90.1	81.9	69	3	4	1	20*	1	0	0
141	104.7	84.8	14	13	4	8	4*	0	0	0
142	93.7	86.0	21	10	11	0	2	6*	0	0
143	91.5	85.2	38	18	11*	0	0	0	0	0
144	90.2	83.3	62	6	1	18*	4	0	0	0
145	88.8	53.0	97	0	28*	0	1	0	0	0
146	89.3	82.9	72	6	1	21*	1	0	0	0
147	93.8	73.6	69	1	3	20*	5	0	0	0
148	101.1	83.2	24	11	2	7*	9	0	0	0
149	95.8	80.9	45	7	5	13*	4	0	0	0
150	87.0	92.3	90	2	26*	0	1	0	0	0

MEAN P = MEAN OF ALL PASSING ITEM
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* = CORRECT CHOICE

THE CHALLENGE OF ASSESING CURRICULUM CHANGES IN NEW ENGLAND
POST-TEST ADMINISTERED AUGUST 15,1969 OMIT AS A SIXTH CHOICE

ITEM	MEAN P	MEAN F	PCT P	CHOICE... A	B	C	D	E	DK	OMIT
151	91.4	86.3	24	4	0	7*	1	17	0	0
152	92.1	81.1	59	3	5	17*	4	0	0	0
153	93.7	86.0	21	6*	2	3	18	0	0	0
154	93.0	83.1	45	9	13*	1	6	0	0	0
155	87.4	88.7	90	1	1	0	26*	1	0	0
156	87.9	87.0	62	18*	6	0	1	4	0	0
157	88.1	86.6	66	4	19*	2	1	3	0	0
158	96.3	82.9	34	5	9	5	10*	0	0	0
159	95.2	75.1	62	18*	4	5	2	0	0	0
160	89.8	86.5	31	9*	13	5	2	0	0	0

MEAN P = MEAN OF ALL PASSING ITEM
MEAN F = MEAN OF ALL FAILING ITEM
PCT P = TOTAL PERCENT PASSING ITEM
* = CORRECT CHOICE

THE CHALLENGE OF ASSESING CURRICULUM CHANGES IN NEW ENGLAND
POST-TEST ADMINISTERED AUGUST 15,1969 OMIT AS A SIXTH CHOICE

MEAN= 87.552 SD= 16.653 N= 29 RANGE= 53-117

SCORE	Z SCO.	TR-SCO.	FREQ.	PCT.	ONE * = 1
53	-2.07	292.52	1	3	*
54	-2.01	298.53	0	3	*
55	-1.95	304.53	0	3	*
56	-1.89	310.54	0	3	*
57	-1.83	316.54	0	3	*
58	-1.77	322.55	0	3	*
59	-1.71	328.55	0	3	*
60	-1.65	334.56	0	3	*
61	-1.59	340.56	0	3	*
62	-1.53	346.57	0	3	*
63	-1.47	352.57	0	3	*
64	-1.41	358.57	0	3	*
65	-1.35	364.58	0	3	*
66	-1.29	370.58	0	3	*
67	-1.23	376.59	2	10	**
68	-1.17	382.59	1	14	*
69	-1.11	388.60	0	14	*
70	-1.05	394.60	0	14	*
71	-0.99	400.61	3	24	***
72	-0.93	406.61	0	24	*
73	-0.87	412.62	2	31	**
74	-0.81	418.62	0	31	*
75	-0.75	424.63	0	31	*
76	-0.69	430.63	0	31	*
77	-0.63	436.64	0	31	*
78	-0.57	442.64	0	31	*
79	-0.51	448.65	1	34	*
80	-0.45	454.65	1	38	*
81	-0.39	460.66	1	41	*
82	-0.33	466.66	0	41	*
83	-0.27	472.67	0	41	*
84	-0.21	478.67	0	41	*
85	-0.15	484.68	1	45	*
86	-0.09	490.68	1	48	*
87	-0.03	496.69	2	55	**
88	0.03	502.69	0	55	*
89	0.09	508.70	0	55	*
90	0.15	514.70	0	55	*
91	0.21	520.71	0	55	*
92	0.27	526.71	1	59	*
93	0.33	532.72	0	59	*
94	0.39	538.72	1	62	*
95	0.45	544.73	1	66	*
96	0.51	550.73	0	66	*
97	0.57	556.74	1	69	*
98	0.63	562.74	2	76	**
99	0.69	568.75	0	76	*
100	0.75	574.75	0	76	*
101	0.81	580.76	0	76	*
102	0.87	586.76	0	76	*
103	0.93	592.76	1	79	*

THE CHALLENGE OF ASSESING CURRICULUM CHANGES IN NEW ENGLAND
POST-TEST ADMINISTERED AUGUST 15,1969 OMIT AS A SIXTH CHOICE

MEAN= 87.552 SD= 16.653 N= 29 RANGE= 53-117

SCORE	Z SCO.	TR-SCO.	FREQ.	PCT.	ONE * = 1
104	0.99	598.77	0	79	*
105	1.05	604.77	1	83	*
106	1.11	610.78	0	83	*
107	1.17	616.78	0	83	*
108	1.23	622.79	1	86	*
109	1.29	628.79	1	90	*
110	1.35	634.80	1	93	*
111	1.41	640.80	0	93	*
112	1.47	646.81	0	93	*
113	1.53	652.81	0	93	*
114	1.59	658.82	1	97	*
115	1.65	664.82	0	97	*
116	1.71	670.83	0	97	*
117	1.77	676.83	1	100	*

THE CHALLENGE OF ASSESING CURRICULUM CHANGES IN NEW ENGLAND
POST-TEST ADMINISTERED AUGUST 15,1969 OMIT AS A SIXTH CHOICE

STUDENT NAME		SCORE	'CT.RANK	STA	STD.SCORE	Z-SCORE
EVANS	NORMAN	95	66	6	545.	0.45
MACFARLANE JR	JAMES W	87	55	5	497.	-0.03
APTT	FREDERS	67	10	2	377.	-1.23
PHAUP	PATRK W	67	10	2	377.	-1.23
WINSLOW	EDWARDF	110	93	8	635.	1.35
POPLAWSKI	EUGENEJ	87	55	5	497.	-0.03
ABBOTT	DOUG W	108	86	7	623.	1.23
HARNOIS	HERMANA	71	24	3	401.	-0.99
BARNES	EVERETW	98	76	6	563.	0.63
HOKANS	CORY B	98	76	6	563.	0.63
CAMERON	PHILP	73	31	4	413.	-0.87
DIXON	RALPH E	79	34	4	449.	-0.51
GRODINSKY	HAROLDM	80	38	4	455.	-0.45
COGAN	RICHARW	114	97	8	659.	1.59
ROY	LUCY A	53	3	1	293.	-2.07
DARLING	SCOTT	85	45	5	485.	-0.15
HACKETT	FRANCID	68	14	3	383.	-1.17
SIMPSON	VELMA E	73	31	4	413.	-0.87
EMILIO	ANN D	81	41	4	461.	-0.39
OSBORNE	DOUG L	94	62	6	539.	0.39
MARSTON	CHAR H	117	100	9	677.	1.77
TOMKINSON	LESTE E	92	59	5	527.	0.27
GRAHAM	CONRADV	71	24	3	401.	-0.99
FEUERSTEIN	MARTIN	97	69	6	557.	0.57
LEWIS	GEORGE	105	83	7	605.	1.05
POIRIER	ROBT O	71	24	3	401.	-0.99

THE CHALLENGE OF ASSESING CURRICULUM CHANGES IN NEW ENGLAND
POST-TEST ADMINISTERED AUGUST 15,1969 OMIT AS A SIXTH CHOICE

STUDENT NAME		SCORE	PCT.RANK	STA	STD.SCORE	Z-SCORE
MURDOCK	ALLEN D	103	79	7	593.	0.93
LANCE	WILLIAM	86	48	5	491.	-0.09
RICE	ROBERTF	109	90	7	629.	1.29

GAIN AND PERCENT GAIN BETWEEN RAW SCORES
SIGNIFICANCE TEST OF DIFFERENCE BETWEEN MEANS

NAME	X	Y	GAIN	PER CENT GAIN
ABBOTT DOUGLAS	78.	108.	30.000	38.461
APT FREDERICK	40.	67.	27.000	67.500
BARNES EVERETT	39.	98.	59.000	151.282
CAMERON PHILIP	45.	73.	28.000	62.222
COGAN RICHARD	70.	114.	44.000	62.857
DARLING SCOTT	58.	85.	27.000	46.551
DIXON RALPH	47.	79.	32.000	68.085
EMILIO ANN	39.	81.	42.000	107.692
EVANS NORMAN	61.	95.	34.000	55.737
FEUERSTEIN MARTIN	52.	97.	45.000	86.538
GRAHAM CONRAD	51.	71.	20.000	39.215
GRODINSKY HAROLD	66.	80.	14.000	21.212
HACKETT FRANCES	48.	68.	20.000	41.666
HARNOIS HERMAN	45.	71.	26.000	57.777
HOKANS CORY	85.	98.	13.000	15.294
LANCE WILLIAM	20.	86.	66.000	330.000
LEWIS GEORGE	42.	105.	63.000	150.000
MARSTON CHARLES	67.	117.	50.000	74.626
MACFARLANE JAMES	63.	87.	24.000	38.095
MURDOCK ALLEN	41.	103.	62.000	151.219
OSBORNE DOUGLAS	57.	94.	37.000	64.912
PHAUP PATRICK	23.	67.	44.000	191.304
POIRIER ROBERT	44.	71.	27.000	61.363
POPLAWSKI EUGENE	70.	87.	17.000	24.285
RICE ROBERT	95.	109.	14.000	14.736
ROY LUCY ANNA	51.	53.	2.000	3.921
SIMPSON VELMA	48.	73.	25.000	52.083
TOMKINSON LESTER	44.	92.	48.000	109.090
WINSLOW EDWARD	90.	110.	20.000	22.222

T= 10.95039

X=raw score, pre test
Y=raw score, post test

The t is significant at the 1% level for 27 degrees of freedom, thus the difference between the mean of X and the mean of Y is significantly different from zero.

A Pearson product correlation was calculated between the pre-test and post-test and that correlation turns out to be .54. The correlation coefficient then indicates that in fact the learning did have a differential effect on the participants involved over the six week period of time.

A Spearman rank correlation coefficient was calculated based on the raw score obtained on the pre-test and post-test for all institutees. Their ranks on the pre and post-test are given as well as the difference in rank, either plus or minus. The Spearman rank correlation coefficient is .49, indicating again the differential effect on the participants over the six week period. A second Spearman rank correlation coefficient was computed based on order of finish on the post-test and raw score rank on the post-test. This resulted in a correlation coefficient of -.15, indicating very little correlation. A T test shows this correlation to be not significantly different from zero at the 10% level.

A split half reliability coefficient was calculated for both the pre-test and the post-test. The reliability of both the pre-test and the post-test turned out to be very high. The reliability coefficient for the pre-test is .92. The reliability coefficient for the post-test is .92. The overall evaluation of the institute then in terms of a pre-test, post-test design indicates: that the tests themselves were very reliable; that they validly tested the material which was being taught; and that there was a very substantial average gain in knowledge over the six week period.

At two week intervals the institute and its instructors were evaluated by the participants. They were asked to apply a four point scale that went from poor to excellent, with NA being not applicable. The calculations of the means of each of the eight areas of activity of the institute and of the personnel involved in the institute are presented at the end of this particular section.

The mean is calculated not only by category but also by grouping all of the categories and coming up with a single mean for that individual across eight areas or activities. In general all means are found to be in excess of three points indicating that the personnel associated with this institute were doing a good to excellent job.

PEARSON PRODUCT MOMENT CORRELATION COEFFICIENT

X	Y
78.00	108.00
40.00	67.00
39.00	98.00
45.00	73.00
78.00	114.00
58.00	85.00
47.00	79.00
39.00	81.00
61.00	95.00
52.00	97.00
51.00	71.00
66.00	80.00
48.00	68.00
45.00	71.00
85.00	98.00
20.00	86.00
42.00	105.00
67.00	117.00
63.00	87.00
41.00	103.00
57.00	94.00
23.00	67.00
44.00	71.00
70.00	87.00
95.00	109.00
51.00	53.00
48.00	73.00
44.00	92.00
90.00	110.00

MEAN OF X= 54.44
MEAN OF Y= 87.55
STAN DEV OF X= 17.68
STAN DEV OF Y= 16.36
COEFFICIENT= .545030

BYX= .504326 AYX=60.091993
BXY= .589014 AXY= 2.879010

X= raw score, pre test
Y= raw score, post test

The correlation coefficient of .545 indicates little correlation, with the six weeks having a differential effect on the people involved. Thus the increase can be attributed to learning over the six week period. The square of this coefficient, .292, indicates that using either of the two regression lines as a means of prediction would produce only 29 % accuracy. These regression equations are:

$$Y = .50X + 60.09$$

$$X = .58Y + 2.88$$

SPEARMAN RANK CORRELATION COEFFICIENT

NAME	X	Y	D
EVANS NORMAN	1.0	11.0	-10.0
MACFARLANE JAMES	2.0	14.5	-12.5
APT FREDERICK	3.0	27.5	-24.5
PHAUP PATRICK	4.0	27.5	-23.5
WINSLOW EDWARD	5.0	3.0	2.0
POPLAWSKI EUGENE	6.0	14.5	-8.5
ABBOTT DOUGLAS	7.0	5.0	2.0
HARNOIS HERMEN	8.0	24.0	-16.0
BARNES EVERETT	9.0	8.5	.5
HOKANS CORY	10.0	8.5	1.5
CAMERON PHILIP	11.0	21.5	-10.5
DIXON RALPH	12.0	20.0	-8.0
GRODINSKY HAROLD	13.0	19.0	-6.0
COGAN RICHARD	14.0	2.0	12.0
ROY LUCY ANNA	15.0	29.0	-14.0
DARLING SCOTT	16.0	17.0	-1.0
HACKETT FRANCIS	17.0	26.0	-9.0
SIMPSON VELMA	18.0	21.5	-3.5
EMILIO ANN	19.0	18.0	1.0
OSBORNE DOUGLAS	20.0	12.0	8.0

POIRIER ROBERT	21.5	24.0	-2.5
TOMKINSON LESTER	21.5	13.0	8.5
LEWIS GEORGE	23.0	6.0	17.0
MURDOCK ALLEN	24.0	7.0	17.0
APT FREDERICK	25.0	27.5	-2.5
BARNES EVERETT	26.5	8.5	18.0
EMILIO ANN	26.5	18.0	8.5
PHAUP PATRICK	28.0	27.5	.5
LANCE WILLIAM	29.0	16.0	13.0

CORRELATION COEFFICIENT= .497537

T= 2.98034

X= rank in class based on pre test raw score
Y= rank in class based on post test raw score
D= difference between ranks

Since the rank was determined by raw score, the correlation may be interpreted in the same way as the Pearson Product Moment Coefficient mentioned earlier. The t shows that the correlation is significantly different from zero at the 1 % level.

SPEARMAN RANK CORRELATION COEFFICIENT

NAME	X	Y	D
RICE ROBERT	1.0	4.0	-3.0
WINSLOW EDWARD	2.0	3.0	-1.0
HOKANS CORY	3.0	8.5	-5.5
ABBOTT DOUGLAS	4.0	5.0	-1.0
POPLAWSKI EUGENE	5.5	14.5	-9.0
COGAN RICHARD	5.5	2.0	3.5
MARSTON CHARLES	7.0	1.0	6.0
GRODINSKY HAROLD	8.0	19.0	-11.0
MACFARLANE JAMES	9.0	14.5	-5.5
EVANS NORMAN	10.0	11.0	-1.0
DARLING SCOTT	11.0	17.0	-6.0
OSBORNE DOUGLAS	12.0	12.0	0.0
FEURESTEIN MARTIN	13.0	10.0	3.0
ROY LUCY ANNA	14.5	29.0	-14.5
GRAHAM CONRAD	14.5	24.0	-9.5
HACKETT FRANCIS	16.5	26.0	-9.5
SIMPSON VELMA	16.5	21.5	-5.0
DIXOM RALPH	18.0	20.0	-2.0
HARNOIS HERMAN	19.5	24.0	-4.5
CAMERON PHILIP	19.5	21.5	-2.0

MARSTON CHARLES	21.0	1.0	20.0
TOMKINSON LESTER	22.0	13.0	9.0
GRAHAM CONRAD	23.0	24.0	-1.0
FEURESTEIN MARTIN	24.0	10.0	14.0
LEWIS GEORGE	25.0	6.0	19.0
POIRIER ROBERT	26.0	24.0	2.0
MURDOCK ALLEN	27.0	7.0	20.0
LANCE WILLIAM	28.0	16.0	12.0
RICE ROBERT	29.0	4.0	25.0

CORRELATION COEFFICIENT= -.150000

T= -.78834

X= order of finish, post test
Y= rank in class based on raw score, post test
D= difference between ranks

The low negative correlation seems to indcate that what little correlation there is may be interpreted as the more time spent on the exam, the higher the rank in class. However, the t is not significant even at the 10 % level, and hence the correlation is not significantly different from zero.

RELIABILITY COEFFICIENT

The reliability of both the pre-test and the post-test was tested by the split halves method. In both cases the test was split into raw scores for the even numbered questions, and raw scores from the odd numbered questions. The correlation between these scores should produce a reliability coefficient approaching 1 if the test is reliable. It is seen that for the pre-test immediately following, and later for the post-test, this is the case and the tests can be assumed reliable.

RELIABILITY COEFFICIENT, PRE TEST

RAW SCORE EVEN	RAW SCORE ODD
48.	45.
17.	23.
38.	29.
24.	24.
22.	29.
29.	23.
21.	18.
41.	37.
21.	21.
43.	42.
18.	26.
31.	30.
19.	25.
14.	9.
39.	24.
30.	28.
28.	29.
36.	34.
23.	18.
20.	25.
26.	25.
12.	8.
25.	23.
35.	35.
46.	44.
22.	22.
28.	19.
20.	19.
31.	35.

RELIABILITY COEFFICIENT= .920554

RELIABILITY COEFFICIENT, POST TEST

RAW SCORE EVEN	RAW SCORE ODD
30.	30.
30.	23.
48.	47.
47.	48.
45.	41.
35.	32.
55.	53.
41.	46.
53.	55.
39.	32.
49.	49.
46.	52.
38.	34.
39.	40.
38.	42.
53.	60.
46.	39.
33.	35.
31.	42.
43.	36.
44.	50.
60.	57.
43.	48.
36.	35.
52.	53.
34.	37.
46.	57.
42.	44.
55.	54.

RELIABILITY COEFFICIENT= .919293

INSTITUTE EVALUATIONS

At the end of each two week session, the institutees were asked to evaluate the presentations of the instructors. They were asked to respond to eight categories for each person, using a four point scale.(See evaluation forms) The results were reduced to means for each question, section means for each instructor, and total means for the particular two week session.

HEW INSTITUTE '69

PROGRESS CRITIQUE Date: _____

Directions: We would like you to evaluate, as you see it, the progress of the HEW Institute and offer your constructive suggestions and criticisms of our activities to date. Listed below are some of the activities, materials, and personnel with whom you have had contact. Please respond to each of these major objectives by checking your feelings toward each product area listed to the right of the objective. Apply a four-point scale of 1=Poor, 2=Fair, 3=Good, 4=Excellent, or NA=Not Applicable. Additionally, list in narrative form the perceived strengths and weaknesses of each presentation and your suggestions for improvement in pursuing the objective. Finally, use the reverse of the form for recording additional reactions to the Institute, and especially note your ideas concerning plausible objectives for the remaining week(s) of the Institute.

Activity - Materials - Personnel		Theory Underlying Object.	Text(s) and Library Matrls	Supplementary Materials	Clarity of Presentation	Gain in Factual Knowledge	Comprehension of Objectives	Applicability of Objectives	Overall Evaluation
Gil Austin	the study of Behavioral Objectives, intro. to use of statistics								
Don Bailey	Intro. to computer programming								
Henry Walbesser	Writing of Behavioral Objectives, creation of learning hierarchies								
Richard Rosen	Dr. Walbesser's assistant								
William Grey	Dr. Walbesser's assistant								

FIRST EVALUATION-JULY 7-JULY 18

MEAN(1)= 3.64
MEAN(2)= 3.55
MEAN(3)= 3.72
MEAN(4)= 3.51
MEAN(5)= 3.44
MEAN(6)= 3.28
MEAN(7)= 3.17
MEAN(8)= 3.58
MEAN(9)= 3.14
MEAN(10)= 2.69
MEAN(11)= 3.09
MEAN(12)= 2.82
MEAN(13)= 3.39
MEAN(14)= 3.14
MEAN(15)= 3.14
MEAN(16)= 3.17
MEAN(17)= 3.67
MEAN(18)= 3.28
MEAN(19)= 3.28
MEAN(20)= 3.44
MEAN(21)= 3.32
MEAN(22)= 3.21
MEAN(23)= 3.03
MEAN(24)= 3.37
MEAN(25)= 0.00
MEAN(26)= 0.00
MEAN(27)= 0.00
MEAN(28)= 0.00
MEAN(29)= 0.00
MEAN(30)= 0.00
MEAN(31)= 0.00
MEAN(32)= 0.00
MEAN(33)= 0.00
MEAN(34)= 0.00
MEAN(35)= 0.00
MEAN(36)= 0.00
MEAN(37)= 0.00
MEAN(38)= 0.00
MEAN(39)= 0.00
MEAN(40)= 0.00
MEAN OF FIRST 8 3.491228
MEAN OF SECOND 8 3.077981
MEAN OF THIRD 8 3.331858
MEAN OF FOURTH 8 0.000000
MEAN OF FIFTH 8 0.000000
TOTAL MEAN 3.303571

(1-8) Dr.Gilbert Austin

(9-16) Donald Bailey

(17-24) Dr. Henry Walbesser

HEW INSTITUTE '69

PROGRESS CRITIQUE Date: _____

Directions: *We would like you to evaluate, as you see it, the progress of the HEW Institute and offer your constructive suggestions and criticisms of our activities to date. Listed below are some of the activities, materials, and personnel with whom you have had contact. Please respond to each of these major objectives by checking your feelings toward each product area listed to the right of the objective. Apply a four-point scale of 1=Poor, 2=Fair, 3=Good, 4=Excellent, or NA=Not Applicable. Additionally, list in narrative form the perceived strengths and weaknesses of each presentation and your suggestions for improvement in pursuing the objective. Finally, use the reverse of the form for recording additional reactions to the Institute, and especially note your ideas concerning plausible objectives for the remaining week(s) of the Institute.*

Activity - Materials - Personnel		Theory Underlying Object.	Text(s) and Library Matrls	Supplementary Materials	Clarity of Presentation	Gain in Factual Knowledge	Comprehension of Objectives	Applicability of Objectives	Overall Evaluation
Gil Austin	the study of the CIPP model and continuation of the study of statistics								
Don Bailey	continuation of computer programming								
Carl Kleiner	lectures on statistics								
Daniel Stufflebeam	CIPP Model								
Bernard Barbadora	Dr. Stufflebeam's assistant								
Michael D. Hock	Dr. Stufflebeam's assistant								
William H. Spain	Dr. Stufflebeam's assistant								

SECOND EVALUATION-JULY 21-AUGUST 1

MEAN(1)= 3.66
MEAN(2)= 3.62
MEAN(3)= 3.59
MEAN(4)= 3.77
MEAN(5)= 3.42
MEAN(6)= 3.46
MEAN(7)= 3.46
MEAN(8)= 3.64
MEAN(9)= 3.41
MEAN(10)= 3.18
MEAN(11)= 3.04
MEAN(12)= 3.27
MEAN(13)= 2.93
MEAN(14)= 3.00
MEAN(15)= 3.03
MEAN(16)= 3.17
MEAN(17)= 2.75
MEAN(18)= 2.93
MEAN(19)= 2.93
MEAN(20)= 2.82
MEAN(21)= 2.58
MEAN(22)= 2.75
MEAN(23)= 2.55
MEAN(24)= 2.68
MEAN(25)= 3.67
MEAN(26)= 3.48
MEAN(27)= 3.37
MEAN(28)= 3.32
MEAN(29)= 3.35
MEAN(30)= 3.25
MEAN(31)= 3.32
MEAN(32)= 3.46
MEAN(33)= 3.00
MEAN(34)= 3.00
MEAN(35)= 3.00
MEAN(36)= 2.00
MEAN(37)= 2.00
MEAN(38)= 2.00
MEAN(39)= 2.00
MEAN(40)= 2.00
MEAN OF FIRST 8 3.581818
MEAN OF SECOND 8 3.133928
MEAN OF THIRD 8 2.733009
MEAN OF FOURTH 8 3.404545
MEAN OF FIFTH 8 2.375000
TOTAL MEAN 3.212984

(1-8) Dr. Gilbert Austin

(9-16) Donald Bailey

(17-24) Carl Kleiner

(25-32) Dr. Dahiel Stufflebeam

HEW INSTITUTE '69

PROGRESS CRITIQUE Date: _____

Directions: We would like you to evaluate, as you see it, the progress of the HEW Institute and offer your constructive suggestions and criticisms of our activities to date. Listed below are some of the activities, materials, and personnel with whom you have had contact. Please respond to each of these major objectives by checking your feelings toward each product area listed to the right of the objective. Apply a four-point scale of 1=Poor, 2=Fair, 3=Good, 4=Excellent, or NA=Not Applicable. Additionally, list in narrative form the perceived strengths and weaknesses of each presentation and your suggestions for improvement in pursuing the objective. Finally, use the reverse of the form for recording additional reactions to the Institute, and especially note your ideas concerning plausible objectives for the remaining week(s) of the Institute.

Activity - Materials - Personnel		Theory Underlying Object.	Text(s) and Library Matrls	Supplementary Materials	Clarity of Presentation	Gain in Factual Knowledge	Comprehension of Objectives	Applicability of Objectives	Overall Evaluation
Gil Austin	continuation of the education evaluation								
Don Bailey	continuation of computer programming								
Dr. Desmond Cook	PERT and Program Management								
Dr. John Cawley	Research Methodology								
Maurice Olivier	Systems Approach								
Jim Carr	research at the State Department level								
Don Randall	research at the State Department level								
Dr. William Asher	Development, Dissemination and Adoption process								

THIRD EVALUATION-AUGUST 4-AUGUST 15

MEAN(1)= 3.56	MEAN(33)= 2.48	MEAN(65)= 4.00
MEAN(2)= 3.66	MEAN(34)= 1.66	MEAN(66)= 0.00
MEAN(3)= 3.52	MEAN(35)= 1.58	MEAN(67)= 0.00
MEAN(4)= 3.73	MEAN(36)= 2.07	MEAN(68)= 0.00
MEAN(5)= 3.68	MEAN(37)= 2.16	MEAN(69)= 0.00
MEAN(6)= 3.65	MEAN(38)= 2.23	MEAN(70)= 0.00
MEAN(7)= 3.62	MEAN(39)= 2.23	MEAN(71)= 0.00
MEAN(8)= 3.62	MEAN(40)= 2.26	MEAN(72)= 0.00
MEAN(9)= 3.21	MEAN(41)= 2.76	MEAN(73)= 0.00
MEAN(10)= 3.18	MEAN(42)= 2.30	MEAN(74)= 0.00
MEAN(11)= 3.00	MEAN(43)= 2.66	MEAN(75)= 0.00
MEAN(12)= 3.19	MEAN(44)= 2.80	MEAN(76)= 0.00
MEAN(13)= 3.26	MEAN(45)= 2.61	MEAN(77)= 0.00
MEAN(14)= 3.26	MEAN(46)= 2.88	MEAN(78)= 0.00
MEAN(15)= 3.29	MEAN(47)= 2.76	MEAN(79)= 0.00
MEAN(16)= 3.16	MEAN(48)= 2.76	MEAN(80)= 0.00
MEAN(17)= 3.14	MEAN(49)= 3.07	MEAN OF FIRST 8 3.635359
MEAN(18)= 3.16	MEAN(50)= 2.77	MEAN OF SECOND 8 3.209580
MEAN(19)= 2.90	MEAN(51)= 2.90	MEAN OF THIRD 8 2.887804
MEAN(20)= 2.88	MEAN(52)= 3.19	MEAN OF FOURTH 8 3.386363
MEAN(21)= 2.62	MEAN(53)= 2.88	MEAN OF FIFTH 8 2.161111
MEAN(22)= 2.88	MEAN(54)= 3.11	MEAN OF SIXTH 8 2.731428
MEAN(23)= 2.59	MEAN(55)= 2.88	MEAN OF SEVENTH 8 3.011111
MEAN(24)= 2.92	MEAN(56)= 3.03	MEAN OF EIGHTH 8 3.572139
MEAN(25)= 3.37	MEAN(57)= 3.62	MEAN OF NINTH 8 4.000000
MEAN(26)= 3.33	MEAN(58)= 3.45	MEAN OF TENTH 8 0.000000
MEAN(27)= 3.40	MEAN(59)= 3.44	TOTAL MEAN 3.07844
MEAN(28)= 3.47	MEAN(60)= 3.65	
MEAN(29)= 3.33	MEAN(61)= 3.44	
MEAN(30)= 3.45	MEAN(62)= 3.62	
MEAN(31)= 3.29	MEAN(63)= 3.59	
MEAN(32)= 3.41	MEAN(64)= 3.66	

(1-8) Dr. Gilbert Austin
(9-16) Donald Bailey
(17-24) Dr. Desmond Cook
(25-32) Dr. John Cawley
(33-40) Maurice Olivier
(41-48) James Carr
(49-56) Donald Randall
(57-64) Dr. William Asher)

Earlier in this report we have already indicated the proposed learning sequence. We will now report the evaluation of each of those proposed sequences. The first week was spent in a general familiarization process with the ideas and concepts behind stating desired education outcomes in the form of behavioral objectives. The second week of the institute was spent in an intensive work session with Dr. Henry Walbesser assisted by Richard Rosen and William Gray. The schedule for that week's work is found immediately following this section. It is not possible to report statistically on this particular section as Dr. Walbesser's pre-test only tested whether the behavior was or was not exhibited. It was, however, possible to count the number of people in each category that exhibited the behavior or did not. Therefore, the following information is presented:

BEHAVIOR REQUESTED	NUMBER EXHIBITING BEHAVIOR
Name the action verb given a performance class definition	21
Name the hypothesis tested by the adequacy ratio	2
Name the least number of hypotheses of learning dependencies needed for a learning hierarchy	5
Describe the necessary components of an HLD	4
Construct at least two performance classes from a list of verbs	24
Identify statements that describe observable performances	26

Construct an assessment task and the acceptable responses for a performance class made by the learner	2
Construct an assessment task and the acceptable responses given the statement of a behavioral objective	2
Identify and name the six components of a behavioral objective given in Walbesser's definition	29
Identify statements which satisfy the first three components of a behavioral objective given a list of statements	27
Identify each of the HLD given a description of a hypothesis	20
Construct a behavioral objective and an assessment task given a non-behavioral objective	2
Describe two causes for rejecting a HLD	1
Describe when a behavioral objective and an assessment task are in performance agreement	1
Name two characteristics of an assessment task	0
Describe changes that can be made in an assessment task	0
Name the least number of action verbs in a behavioral objective	17
Name two references on constructing behavioral objectives	17

It is not possible to make any direct comparison between the pre-test and the post-test since they were very different tests. It is, however, possible to reach the generalized conclusion that the participants learned a good deal over this two week intensive period of studying behavioral objectives as judged by the fact that most of them were able to complete successfully the first two of the requests on the final test. Many fewer did as well on the third and most difficult portion of that final examination. The list of the tasks on the pre and post-test and the documentation as to their presence or absence will be found in Appendix B.

As is evident by careful study of the plan for this week there thirty-seven (37) tasks that each participant had to complete. A complete copy of these thirty-seven (37) tasks and their objectives will be found in Appendix B.

POST-TEST

BEHAVIOR REQUESTED	NUMBER EXHIBITING BEHAVIOR
Identify and name all of the HLD given a schematic of a learning hierarchy	22
Demonstrate the procedures for validating a learning hierarchy	16
Construct explanations and revisions for those hypotheses of learning dependency rejected by the validation data	5

Schedule:

Monday

1. Introduction
2. Preassessment measure
3. Meet with consultant in smaller group
4. Construct small teams
5. Complete Set A - Tasks 1-5
6. Seminar for all participants - Learning Hierarchies

Tuesday

1. Complete Set B - Tasks 6 - 13
2. Complete Set C - Tasks 14 - 19
3. First, second, and third group viewing of TV tape on the use of behavioral objectives by new teachers

Wednesday

1. Complete Set D - Tasks 20-24
2. Complete Set E - Tasks 25-29
3. Seminar for all participants - Hierarchy Validation Ratios

Thursday

1. Complete Set F - Tasks 30-33
2. Complete Set G - Tasks 34-36

Friday

1. Complete Set H - Task 37
2. Seminar for all participants - What Next
3. Postassessment measure

The third week of the institute was spent in an intensive study of various methods of evaluating educational research. Particular emphasis was given to the use of context, input, process and product (CIPP) evaluation developed by Dr. Daniel Stufflebeam of Ohio State University. The participants were also exposed to and studied intensively the book authored by Campbell and Stanley known as Experimental and Quasi-Experimental Designs for Research. The material that the participants in this institute were asked to read and study during this particular two week period of time will be found in Appendix C and is listed below:

"Evaluation as Enlightenment for Decision-Making"
Daniel L. Stufflebeam

"Process Approach in Biology Instruction"
Kurtz, Edinger, Ferko and Murray

"Context Evaluation of Instruction in Local School Districts"
Robert Hammond

"The Countenance of Educational Evaluation"
Robert E. Stake

"Evaluation at the Local Level"
Dr. Robert L. Hammond

The fourth week of the institute was given over to an intensive study of the use of the CIPP model in educational evaluation. This week was conducted by Dr. Daniel Stufflebeam and three assistants from Ohio State University. Their names: Bernard Barbadora, Michael Hock and William Spain. The participants in the institute were given a pre-test and a post-test designed by Dr. Stufflebeam and his assistants. Dr. Stufflebeam and his staff have prepared a product evaluation of their one week participation in this institute. It will be found immediately following this section.

As careful study of the master schedule of events will indicate the participants had a very busy week. A great deal of time was spent working on a simulation exercise entitled, "Simulated Local School Evaluation: Materials for a Training Institute in Evaluation", created by Blaine R. Worthen and Michael D. Hock. There are no available copies of this manuscript.

MASTER SCHEDULE OF EVENTS

for

NEW HAMPSHIRE EVALUATION INSTITUTE

JULY 28 - AUGUST 1

	Monday		Tuesday		Wednesday		Thursday		Friday
8:30	STUFFLEBEAM Orientation Introduction	8:30	HOCK Context Evaluation	8:30	STAFF Respond to Questions & Concerns	8:30	STAFF Respond to Questions & Concerns	8:30	Response to TASK V
9:00	BARBADORA Initial Evaluation			9:00	TASK II Continued	9:00	HOCK Input Evaluation	9:00	SPAIN Design of Evaluation
9:30	SPAIN Problems In Evaluation	10:00	Introduction to Simulation	10:00	Another Look at Context Evaluation	9:30	Introduction to TASK IV	10:00	STUFFLEBEAM Product Evaluation Design
10:30	COFFEE	10:30	COFFEE	10:30	COFFEE	10:30	COFFEE	10:30	COFFEE
11:00	BARBADORA Definition of Evaluation	11:00	Simulation TASK I	11:00	Introduction to TASK III	11:00	Wrap Up of TASK IV	11:00	BARBADORA Final Evaluation and Wrap Up Close of Institute
						11:30	SPAIN Product Evaluation		
12:00	LUNCH	12:00	LUNCH	12:00	LUNCH	12:00	LUNCH	12:00	LUNCH
1:00 to 2:30	STUFFLEBEAM Detail of The CIPP Model	1:00	TASK I Continued	1:00 to 2:30	TASK III Continued	1:00 to 2:30	TASK V		
		2:00	Response to TASK I		Response to TASK III		HOCK Process Evaluation		
		2:30	TASK II						
7:00 to 8:00	Meeting With Team Leaders For Simulation	8:30 to 11:00	Group and Individual Discussion		FREE	8:00 to 10:30	Group and Individual Discussion of Projects		

PRODUCT OF EVALUATION SECTION FOR THE FINAL REPORT

NEW HAMPSHIRE EVALUATION INSTITUTE

JULY 28 - AUGUST 1, 1969

Prepared By

OHIO STATE UNIVERSITY

EVALUATION CENTER STAFF

Bernard M. Barbadora
Michael Hock
William Spain
Daniel L. Stufflebeam

In an effort to summarize, describe, and assess the impact of the recent Evaluation Institute conducted at the University of New Hampshire the following report has been prepared.

In response to the question: Has your understanding of evaluation been considerably broadened as a result of the Institute activities and experiences? All of the participants responded affirmatively.

Concerning our inquiry relating to the participants general reaction as to how they would best describe the Institute, the following statistics were obtained:

1 out of 29 of the participants responded - Very Unfavorable

1 out of 29 of the participants responded - Neutral

2 out of 29 of the participants responded - Slightly Favorable

25 out of 29 of the participants responded - Very Favorable

Relating to the questions: How relevant the Evaluation Institute was to the participant's background, problems, and needs:

1 out of 29 of the participants responded	The information generated by the Institute was too difficult to understand and to be able to benefit from the information.
3 out of 29 of the participants responded	I understand almost everything, but the Institute didn't help me solve my most important problems or meet my basic needs.
25 out of 29 of the participants responded	The Evaluation Institute dealt with my problems and needs in an understandable and interesting way.

In trying to arrive at some descriptive evaluation data as to how well the Evaluation Institute achieved its basic objectives, the following figures were obtained:

OBJECTIVE I

To have the participants be able to identify the various stages of the CIPP Evaluation Model, and apply these stages in various task situations in a given simulated evaluation problem. The participants' understanding of the various stages will be determined in terms of an oral and written response to each task in the simulation and by an Institute reaction scale.

The results of the data indicated that twenty-five out of twenty-nine of the participants, as determined by their responses and the Institute reaction scale, were able to identify, and be aware of the problems and limitations in the various stages of CIPP Evaluation. A total of two participants seemed to be uncertain about identifying the various stages, and the remaining two participants attained a small fraction of success in terms of identifying and becoming aware of the problems or limitations of the various stages of CIPP.

OBJECTIVE II

The total group mean gain of the participants, in terms of increased knowledge about the realm of CIPP Evaluation, will shift to a higher mean as determined by the results of an evaluation achievement examination.*

*Statistical results in terms of attaining the last two objectives can be found in the data summary contained in the report.

OBJECTIVE III

The participants attitudes (receiving, responding, valuing, characterizing, and organizing) will be more favorable as a result of the Institute as determined by an attitude scale administered on a pre and post test basis.*

Due to the fact that in the pre-test of participants one person arrived late, his attitude scale had to be eliminated from the post test analysis. Therefore, N = 28 on the attitude survey.

ATTITUDE SCALE

In respect to the attitude instrument, the five point Likert* Scale was used to determine participants performance. The scale has a range of from one to five points with the weight one representing a definite negative rating, to the weight of five which is the most positive. Each item on the test is individually rated and then a total score is computed by summarizing each particular item. (Total score on this particular test could have ranged from 34 - least positive to 170 - most positive.) By dividing the total score by the number of items on the particular test, the resulting score will then fall along the five point continuum.

With this basic information in mind, and using the criteria established by the Likert Scale, the following characteristics were evident in statistically comparing and contrasting the pre and post test attitude scale:

*Statistical results in terms of attaining the last two objectives can be found in the data summary contained in the report.

*D. Krech, D. Crutchfield, and E. L. Ballachey. Individual and Society. New York: McGraw-Hill Book Co., 1963. (Especially Chapter 5).

Pre Test Number of Examinees	n =	28
Post Test Number of Examinees	n =	28
Number of Items on the Pre Test	=	34
Number of Items on the Post Test	=	34
Average Total Score of the Pre Test	=	135.46
Mean Item Score for the Group	=	3.92
Average Total Score for the Post Test	=	142.04
Mean Item Score for the Group	=	4.18
Pre Test Standard Deviation	σ =	15.77
Post Test Standard Deviation	σ =	11.94
Variance of the Pre Test	=	248.61
Variance of the Post Test	=	148.26

In respect to the Evaluation Achievement Examination, certain points will now be emphasized in order to enable the reader to more clearly analyze the statistical data that were generated through the utilization of the instrument.

1. The range of possible scores could have extended from 0 to 30.
2. The complete test was objective in nature.
3. Correct answers were assigned a weight of one.
4. On both examinations N = 29.
5. The examination was administered on a pre and post test basis.
6. Names were not included, so, an error term could not be computed, and a significance test between pre and post test means could not be calculated.

Then, in terms of a statistical comparison and contrast between the pre and post test Evaluation Achievement Examination, the following characteristics were evident:

Pre Test Number of Examinees		n = 29
Post Test Number of Examinees		n = 29
Number of Items on the Pre Test		= 30
Number of Items on the Post Test		= 30
Pre Test Mean		= 12.86
Post Test Mean		= 16.31
Pre Test Standard Deviation		σ = 3.38
Post Test Standard Deviation		σ = 2.31
Pre Test Range of Scores	7 - 19	= 12
Post Test Range of Scores	12 - 20	= 8
Pre Test Median		= 12.50
Post Test Median		= 16.50
Pre Test Mode		= 14
Post Test Mode		= 17
Variance of the Pre Test		= 11.42
Variance of the Post Test		= 5.35

In summarizing these two sets of data, it could be stated that the participants attitude toward the realm of educational evaluation definitely increased. Specifically, there was a 6.58 point gain of total score on the post test.

With respect to the Evaluation Achievement Examination, the results can be summarized by stating: that the mean, median, and mode, all increased in post testing, while the standard deviation was lowered. Specifically, there was a group mean gain in the achievement scores from pre testing to post testing of 3.45 points.

Thus, as a result of the data obtained from our week long Evaluation Institute we are lead to conclude that the institute had a favorable impact on the participants both in terms of making their attitudes more favorable toward evaluation, and increasing their knowledge about evaluation.

DATA SUMMARY

on

Pre and Post Test

EVALUATION ACHIEVEMENT EXAMINATION

PRE TEST
STATISTICAL DATA
EVALUATION ACHIEVEMENT EXAMINATION
NEW HAMPSHIRE INSTITUTE

	X Score	f	x'	fx'	x'^2	$f(x'^2)$
	19	1	6	6	36	36
	18	2	5	10	25	50
	17	2	4	8	16	32
	16	3	3	9	9	27
	15	1	2	2	4	4
	14	5	1	5	1	5
Assumed 0	13	1	0	0	0	0
	12	2	-1	-2	1	2
	11	3	-2	-6	4	12
	10	3	-3	-9	9	27
	9	4	-4	-16	16	64
	8	1	-5	-5	25	25
	7	1	-6	-6	36	36
		N = 29		-4		320

$$M = \text{Assumed Mean} + \frac{\Sigma fx'}{N}$$

$$M = 13 + \frac{-4}{29} = 13 + \frac{-.14}{4.00} = 12.86$$

$$\begin{array}{r} 13.00 \\ -.14 \\ \hline 12.86 \end{array}$$

$$\begin{array}{r} 29 \overline{)4.00} \\ \underline{2\ 9} \\ 1\ 10 \\ 1\ 16 \end{array}$$

Mean = 12.86

Mode = 14

Range = 7-19 = 12

Median = 13.50

σ = 3.38

Variance = 11.41

$$\sigma = \sqrt{\frac{N(\Sigma fx'^2) - (\Sigma fx')^2}{N(N-1)}}$$

$$\sigma = \sqrt{\frac{29(320) - (-4)^2}{29(29-1)}} = 3.38$$

POST TEST
STATISTICAL DATA
EVALUATION ACHIEVEMENT EXAMINATION
NEW HAMPSHIRE INSTITUTE

	X Score	f	x'	fx'	x'^2	$f(x'^2)$
	20	3	4	12	16	48
	19	2	3	6	9	18
	18	4	2	8	4	16
	17	8	1	8	1	8
Assumed 0	16	3	0	0	0	0
	15	3	-1	-6	1	3
	14	2	-2	-4	4	8
	13	1	-3	-3	9	9
	12	3	-4	-12	16	48
		N = 29		9		158

$$M = \text{Assumed Mean} + \frac{\Sigma fx'}{N}$$

$$M = 16 + \frac{9}{29} = 16.31$$

29/9.00 = .31

8 77
30
29

16.00
+.31
16.31

Mean = 16.31

Mode = 17

Range = 12-20 = 8

Median = 16.69

σ = 2.36

Variance = 5.54

$$\sigma = \sqrt{\frac{N(\Sigma fx'^2) - (\Sigma fx')^2}{N(N-1)}}$$

$$\sigma = \sqrt{\frac{29(158) - (9)^2}{29(29-1)}} = 2.36$$

The last two weeks of the institute were given over to two-day and one-day seminars directed by visiting consultants. The alternate days were filled in with discussion with the director of the institute, in an attempt to pull together the material that was being presented on the part of the consultants. It was not possible to create any pre-test or post-test for these short two-day seminars, but the consultants were evaluated, as we have already indicated, on evaluation forms at the end of the two week period. Dr. Desmond Cook of Ohio State University was a consultant for two days. The topic of his discussion was "Educational Program Management" and PERT as a tool within that management concept. Dr. Cook had a very lengthy and well developed overhead transparency presentation and the interaction with the institute trainees seemed to be excellent. For two days previous to Dr. Cook's attendance at the institute the trainees had been required to read the book he had authored entitled, "Program Evaluation and Review Technique" and "A Generalized Project Management System Model". Immediately following this section you will find the outline that Dr. Cook presented in his discussion with the participants over the two days he was here.

Dr. John Cawley from the University of Connecticut came for a one-day seminar in which he discussed the problems associated with conducting educational research in a school situation. Particular area of concentration was his research in psychomoter difficulties in the area of reading.

Educational Program Management Center
Educational Development Faculty
College of Education
The Ohio State University
Columbus, Ohio 43210

Outline for Project Management Presentation

I. Why Project Management in Education?

II. The Nature of Project Management

- A. Project Characteristics
- B. Management Functions and Processes
- C. Management Systems

III. Generalized Project Management Model

- A. Planning Systems
  1. Project Definition
  2. Work Flow
  3. Time Estimation
  4. Scheduling and Resource Allocation
  5. Cost Estimating and Budget
- B. Control System
  1. Reports
  2. Management Actions
  3. Implementation and Recycling

Mr. Maurice Olivier made a one-day presentation on the subject of "Systems Thinking, Systems Analysis and Its Implications for Education". The participants were asked to read in preparation for this presentation the booklet entitled, "What is the Systems Approach and What's in it for Administrators". A copy of this pamphlet will be found in Appendix E of this report.

One day of the institute was given over to a presentation by personnel from the New Hampshire State Department of Education: Dr. Donald Randall, consultant for research and testing and James Carr, consultant for guidance and counseling. Their general topic was, "The Implications of Research Based on the Results of Five Statewide Testing Programs in the state of New Hampshire, at Grades 2, 4, 6, 8 and 10".

The final consultant available to the summer research institute was Dr. William Asher from Purdue University. The topic of his presentation was "Development, Dissemination and Adoption", a copy of which will be found in Appendix F. Dr. Asher spent the first day of his presentation in discussing with the participants the problems associated with development, dissemination and adoption of educational research findings to actual and practical application on the part of educators dealing with students. The second day of Dr. Asher's presentation was spent in acting as a consultant to the individual participants and reviewing their proposals and making critical comments based on them. You will find the general outline of Dr. Asher's topic immediately following this section.

In Appendix F of this report you will find a paper entitled, "The Ingredients of a Research Proposal" which was given to the participants as a guide for their preparation of a terminal project which was required of all of them. The titles of each of the participants' projects will be found immediately following this page.

During the entire period of the institute the participants were taught statistics that were appropriate and necessary for their use. This task was done by Carl Kleiner, a work-study student, majoring in mathematics,assigned to the Bureau. He had worked closely with the director in planning this institute. Selected statistics were taught from the following texts:

"Statistical Analysis in Psychology and Education"
by George A. Ferguson

"Non-parametric Statistics"
by Sidney Siegel

This report so far has dealt only with the activities which took place in the morning and in some cases the first part of the afternoon and in the evening. The institute had as part of its proposed training exposure to the problems associated with running a computer and writing computer programs. The following is a description of what took place in this institute in terms of computer programming.

First week: At the first class meeting, each member of the Institute was asked to write a brief description of his previous experience with computers, if any. One person was very familiar with the Dartmouth computer and had worked with one of its remote terminals in his school (Concord). Several members of the Institute had made brief visits to computation centers, but the vast majority of the class had not even seen a computer. On the basis of this information, it was decided that the instruction would start at the most elementary level.

The objectives of the class were stated at the first meeting: that each member of the institute would become familiar with the FORTRAN language and write a successful computer program to do some type of data reduction which would be useful in his school system. The computer program was to be related to the research which the member was doing for his individual project if the research project was one which required data reduction. If a research project did not require data reduction, the student was allowed to write a computer program of comparable difficulty to others being done for the class.

The instructional portion of the class was begun with a general description of what a computer is, what it can and cannot do, and how it may be used as a useful tool in high school testing and instruction as well as in other fields. A simplified description of the internal workings of the computer was presented, and various types of input/output devices were discussed. Each student received instruction in the use of a keypunch and punched his name as an assignment. Relevant readings in Chapter 1 of "A Guide to Fortran Programming", were assigned.

A simple FORTRAN program to read, punch and print a list of names was presented in class. A step-by-step relationship between the FORTRAN program and the computer steps executed as a result of the FORTRAN instruction was discussed at great length.

At the first possible opportunity, the class was taken to see the IBM 1620 computer system at the University. This computer system is small, and relatively easy to use in demonstrating the operation of computers in general. This "first-hand" look at a computer system gave the students the opportunity to see what the equipment being discussed in class looked like physically. It also demonstrated the operation of the computer and its peripheral equipment as a system. Each student had keypunched his name on a card, and these cards were collected at the beginning of the demonstration. At the conclusion of the demonstration, the cards were listed using the program presented in class to demonstrate the usefulness and speed of the computer system in preparing a class roster. An error was introduced into the program to demonstrate the error-detecting capability of the FORTRAN compiler.

Second Week: The computer program which was used in the first week's demonstration was reviewed, and questions about the computer system were answered. The purposes of the FORTRAN compiler program and subroutines were also discussed. This discussion was followed by a discussion of the corresponding processes of the IBM 360 computer system and its associated remote terminals. Each student was asked to punch a modified version of the original demonstration program and run it with his own data on the 360 computer system. The proper job control cards were provided for each student, and a visit was made to the 360 area of the Computer Center in order to explain the steps in preparing a job for this machine.

The remainder of this week was used for discussing other types of FORTRAN statements and constants and variables used in FORTRAN programs. Chapters 2 and 3 and part of Chapter 4 were assigned in the text.

Third Week: Flow diagrams were presented, and several examples were used to demonstrate their usefulness. Students were asked to prepare a flow diagram for computing the mean and standard deviation of a set of test scores. A standard solution to the problem was discussed at the next class meeting. Each student was then asked to write a FORTRAN program from the flow diagram and run the program with actual data on the 360 system. A similar assignment was made for the computation of a Pearson-product moment correlation coefficient. These statistical programs were related to material which had been presented in other portions of the institute.

Fourth Week: Subscripted variables, including table look-ups, do-loops, and the DIMENSION statement were discussed. Addition and multiplication of array elements were presented and related assignments were given from the text. A program for finding the largest element in an array was presented and an assignment to find the range of a set of scores using the basic concepts of this program was given. Reading assignments were given from Chapter 5 and 6 in the text.

Fifth and Sixth Weeks: No formal classes were held. Each student was to work on his computer program with the instructor and other personnel from the Bureau of Educational Research and Testing Services acting as consultants. The major emphasis of these last two weeks was on the participants using the remote terminal to the IBM 360 as they worked on their own projects. All of the students appeared to take the computer project very seriously, and many of them made repeated visits to the Bureau to discuss failures or successes of their programs. Each student fulfilled the requirement for the computer part of the institute, and many expressed the feeling that this experience would be very useful to them when they returned to their schools in the fall.

Immediately following is a list of Computer Programs done by the participants of the institute.

The computer portion of this institute was conducted by Donald Bailey, a Computer Programmer for the Bureau of Educational Research and Testing Services,

PROGRAM TO COMPUTE MEAN, STANDARD DEVIATION, CORRELATION COEFFICIENT, AND COEFFICIENT OF VARIATION
Cory Hokans

A PROGRAM TO COMPUTE MEANS, STANDARD DEVIATION AND STANDARD ERROR OF DIFFERENCE OF X AND Y SCORES
Charles H. Marston

A PROGRAM TO COMPUTE STANINES
Velma E. Simpson

CORRELATIONS OF IQ AND ACHIEVEMENT SCORES
Norman Evans

SOCIAL STUDIES CURRICULUM EVALUATION OF MERRIMACK VALLEY SCHOOL DISTRICT
Martin Feuerstein

STANDARD DEVIATION, MEAN AND MODE OF TWO GROUPS OF SCORES
Herman Harnois

PROGRAM TO PRINT COUNSELOR, DATE AND TIME FOR DAILY ACTIVITIES OF A COUNSELOR AND TO KEEP A RUNNING TALLY OF THE TIME IN EACH ACTIVITY
Scott Darling

PROGRAM TO COMPUTE CORRELATION COEFFICIENT BETWEEN TWO VARIABLES
Ann Emilio

MEAN, STANDARD DEVIATION AND CORRELATION COEFFICIENT OF VARIOUS SCORES
William W. Lance

PROGRAM TO USE WITH BI-LINGUAL SURVEY FOR BERLIN AREA
Conrad Graham

A PROGRAM TO SHOW THE CORRELATION COEFFICIENT BETWEEN THE SCORES ON THE CALIFORNIA READING TEST AND THE STANFORD ACHIEVEMENT TEST
Les Tomkinson

COMPUTATION OF THE MEAN, STANDARD DEVIATION, CORRELATION COEFFICIENT, AND STANDARD SCORE ON A TEST THAT WAS ADMINISTERED TO STUDENTS AND TO COMPARE THESE RESULTS WITH THE NATIONAL NORM FOUND IN THE MANUAL OF THE STANDARDIZED READING SURVEY
Sister Lucy Anna Roy

PROGRAM TO SHOW THE EFFECT OF PLACEMENT IN A TRANSITIONAL CLASS ON CHILDREN ENTERING THE FIRST GRADE AT SOUTH SCHOOL, LYNNFIELD, MASSACHUSETTS
Richard W. Cogan

PROPOSAL TO EVALUATE OUR SCHOOL'S READING, GRADES 1-3
James MacFarlane

PLOTTING AND FLOW CHART ANALYSIS
Edward Winslow

PROGRAM TO COMPUTE MEANS, STANDARD DEVIATION, CORRELATION COEFFICIENT, REGRESSION LINE OF TWO VARIABLES
Douglas Abbott

PROGRAM TO LIST PHYSICS TEACHERS IN MAINE AND GET AVERAGE COST OF COURSE STATEWIDE AND BY TOWN
Harold Grodinsky

PROGRAM TO COMPUTE STANDARD DEVIATION
Francis Hackett

A PROGRAM TO GRADE STUDENTS
Pat Phaup

PROGRAM FOR CALCULATING MEAN AND CORRELATION COEFFICIENT OF N SCORES
Douglas Osborne

PROGRAM FOR PRINTOUT OF STUDENT NAME, IQ, PRE-TEST, POST-TEST, ACHIEVEMENT AND CORRELATION COEFFICIENT FOR IQ AND ACHIEVEMENT TEST
Gene Poplawski

PROGRAM TO COMPUTE MEAN, STANDARD DEVIATION AND CORRELATION COEFFICIENT
Al Murdock

PROGRAM FOR EVALUATION OF PROJECT HEAD START
Frederick Apt

PROGRAM TO COMPUTE GRADE POINT AVERAGE
Robert O. Poirier

PROGRAM TO FIND THE MEAN, STANDARD DEVIATION, AND CORRELATION COEFFICIENT
Phil Cameron

A PROGRAM TO FIND THE CORRELATION COEFFICIENT BETWEEN TWO VARIABLES
Robert E. Rice

PROGRAM WHICH SORTED PRE-TEST DATA, COMPUTED MEAN, STANDARD DEVIATION RANGE AND CORRELATION COEFFICIENT
George Lewis

PROGRAM FOR COMPUTING CORRELATION COEFFICIENT BETWEEN IQ AND VOCABULARY FOR GRADE TWO
Everett Barnes Jr.

PROGRAM FOR COMPUTATION OF STANDARD DEVIATION AND CORRELATION COEFFICIENT OF ACHIEVEMENT TEST
Ralph Dixon

CONCLUSION

This report has taken the form of an evaluation. The specific format of that evaluation is the CIPP model.

Context Evaluation

The information presented in the first part of this report is a context evaluation. It defines the needs for and generalized plan for the running of the institute, it identifies the place it will be conducted, and in general specifies the types of people who will be invited to attend it.

Input Evaluation

The second phase of this report is an input evaluation in which the author documents the various inputs which were available to the participants of this particular institute. These inputs took the form of presented material, by both the director of the institute and visiting lecturers, as well as a very heavy schedule of reading materials to be studied on the participants' own time.

Process Evaluation

It is hoped that this report documents very specifically and in behaviorally expressed objectives just what it was that the institute director planned to have happen to the participants. The entire institute itself was laid out in the form of a PERT chart so that there was a maximum concern with the interfacing of one particular section of this institute with those which preceded it and those which followed it. Therefore, it was possible to evaluate the progress of the participants and modify the

program to meet their expressed and observed needs.

Product Evaluation

The many pre-test, post-test situations which have already been discussed in this report, I think, justify the fact that it achieved the specific objectives that it set out for itself. On the basis of these four evaluations - context, input, process and product-it is the feeling of the author that he "practiced what he preached". It is the author's general feeling that this was a very successful summer research institute.